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THE AGRICULTURAL STATISTICS OF

B U R M A

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Summary. The agricultural statistics of Burma are of high quality in part, and only fair in part. Estimates of acreage sown to crops are the result of an annual check against cadastral survey maps by the staffs of the district land record offices and there is every reason to judge that they are reliable. On the other hand, estimates of yields per acre are based upon enumerations of production which have not been checked to ascertain the degree to which they reflect the actual levels. Such overall crop checks as are available indicate these may give understatements of production when applied to the acreage estimates. Early season estimates are based upon reported condition applied to predetermined normal yields; many scheduled early season reports have not been issued; the system needs to be tested for reliability. More timely issuance and coverage of additional crops is considered imperative by Burmese officials and commercial interests.

Scope of Study. The information upon which this report is based was obtained by personal visit in July 1958 to Burma, during which interviews were had with officials of government Ministries at Rangoon and Mandalay, with District officers at Mandalay and Sagaing, and kwin fieldmen at Ngwe Daung and Kyaukme villages.

Source of Statistics. Agricultural statistics in Burma are gathered primarily by the Settlements and Land Records Department of the Burmese government. This Department is part of the revenue service of the government; it has a long history of interest in and records of the land as a source of taxes. Under the British rule the land tax was the principal source of revenue to the government; to a major extent this is still true. In collecting land taxes the British as early as 1890 made a cadastral survey which provided a record of land ownership tied in with topographical maps of the individual fields. A system was set up for evaluating the output of the land in terms of what each field would yield to a given crop. Thus first class rice land was graded R1, second class was graded R2, etc. The central plain of Burma was entirely surveyed in this manner and part of the outlying uplands also. Maps on a scale of 16 inches to a mile were drawn to show all the regular topographical features, creeks, rivers, lakes, etc., and also the roads, and the bunds which enclose the fields for irrigation purposes. It was the duty of the revenue officer in each small area of Burma to assess the taxes against each field and summarize these for each owner.

1/ There is a Commissioner of Settlement and Land Records, who has two Departments under him, 1. Settlements and 2. Land Records: The Settlements Department obtains statistics once in about 20 years in each District in turn; the Land Records Department is concerned with current statistics.

Under British control practically all of Burma was in the ryatwary revenue system, in which the land revenue was collected directly from the peasants. This system of land revenue led to the setting up of a check organization to determine the equity of the revenue paid by various producers and owners of land. Settlement parties moved around the country and recommended to the land records revenue organization what each peasant should pay. This was done area by area over a period of twenty years. A relatively large organization was required and eventually it became a part of the administration and became the principal source of crop information.

The agricultural statistics, which were a by-product of the assessment, became important and were recorded separately from the assessment data. At the present time there is a District Officer in charge of Land

Records in each one of the 32 districts of Burma. This officer is responsible for keeping up to date the records of land ownership. He has to this extent a responsibility corresponding to that of the county registrar of deeds in a mid-western state of the United States. He has a group of inspectors who supervise a group of fieldmen who are responsible for the collection of the original crop information. In all, nearly 1,500 fieldmen are employed in this work. The 32 districts are divided into townships and these are further sub-divided into village tracts and finally into kwins. A kwin averages about 500 acres in size; a map is available for it. For this purpose the area is surveyed by the use of a plane table. Acreage within a given field is determined mathematically or by use of a planimeter. In addition to a register of the fields with numbers and acreages, a second register of ownership is maintained. The fieldman is an employee of the Burmese Land Records Department. He is usually, but not always, a local man. One such fieldman has twenty to forty kwins. He visits the kwins for which he is responsible to identify the crops which are being grown on the land. His work is subject to review by an inspector; the inspector in turn has his work reviewed by the district officer.

under supervision of
The land is graded at least every 20 years / a Settlement Officer who represents the Director of the Department. There is one settlement office for north Burma and one for south Burma. In addition an immediate review is made whenever a major change takes place in the land use.

Acreage Estimates. Each year the fieldman carries his map into the field with him to record land use, crops growing, fallow, or crop failure. He then compiles a report of the area in each crop. There is no tax on fallow, and in north Burma no tax on fields which have a crop of less than 25 percent of normal. The fieldman keeps this record for one year and then sends it to the District office for filing. He visits the fields three times a year, an early visit in July and August, a middle visit in November and January and a late visit in March and April to observe on each of these occasions what use is being made of the land. He summarizes the information in May and June and sends it to the District office.

The field force is also responsible for several early reports of yield per acre. After consulting with farmers they report condition in terms of a normal, giving the figure in percentages with 100 equal to the normal yield. This 100 percent normal yield has been calculated in advance for each kwin and an average percentage of normal is calculated by means of weighting according to the area in each kwin. The Department is not satisfied with the indications from this source; the earlier crop reports are limited to acreage.

The village headman makes an annual enumeration of livestock for each village which is a group of kwins. This enumeration is made in March and results are sent by the fieldman with the crop data in June. The Land Settlement and Records work before the war was in the Ministry of Finance and Revenue; it is now in the Ministry of Land Nationalization, which is responsible for land reform in Burma. It is buying up large estates and dividing them for redistribution to tenants who have been working on them. This project is moving slowly because of the drain on the budget by the financial commitments involved.

Yield and Production. The production of individual crops is based upon judgment reports which the fieldman makes after he has asked farmers about the probable or actual outturn from their holdings. If a tenant works the land or part of the land, the fieldman asks him about the yield. He totals the production as reported by the producers and sends the information to the inspector. The fieldman is permitted to inform the inspector that he disagrees with the production reported by given operators but is not allowed to alter the report. To help him appraise the probable outturn of the commodities the map has on its reverse a list of normal outturns of crops for given quality grades of land. The normals are calculated from crop cuttings made at the time when the Settlement officer revises the land grades.

The land tax is assessed according to the grade of land and not on the current outturn. It is claimed that this minimizes the bias in reporting both area and production. However, in north Burma, if outturn is less than one fourth the normal, no taxes are assessed.

Estimates of outturn are made for rice, cotton, peanuts, early sesame and late sesame, and, for government use only, for beans and peas. The Department has other work, such as the administration of the land nationalization act, the bringing to date of records, etc. Crop cuttings have been limited to this review in connection with the regrading of the land. The Department is considering the use of crop cuttings for estimating yields and is planning some pilot studies in 1959, but had not decided to use random sampling in selecting the survey units.

Publication. Information on acreage, yield, and production are summarized for all Burma by the Commissioner of the Settlement and Land Records Departments at Rangoon and published by his Department in an annual "Season and Crop Report". For many years this was printed in English as well as in Burmese. The last such English report related to the crops of the year ending June 30, 1952, which was issued under date of November 5, 1953. Since that time the report has been published only in Burmese.

Crop forecasts are likewise published only in Burmese. They appear currently. the schedule of reports follows:

BURMA: Crop Forecasts Schedule for Principal Crops

	<u>Rice</u>	<u>Cotton</u>	<u>Groundnut</u>	<u>Early Sesamum</u>	<u>Late Sesamum</u>
1st Forecast	7th Oct.	3rd Aug.	3rd Aug.	25th July	20th Sept.
2nd Forecast	7th Nov.	3rd Oct.	3rd Oct.	20th Sept.	20th Nov.
3rd Forecast	7th Dec.	3rd Dec.	3rd Dec.	- -	20th Dec.
4th Forecast	7th Jan.	3rd Feb.	3rd Feb.	- -	- -
5th Forecast	7th Feb.	3rd April	3rd April	20th Dec.	20th Jan.

As previously stated, the first and second forecasts relate only to the acreage sown; the later ones include quantities. Final estimates do not appear until sometime in the succeeding year. No reports are made for crops other than the four listed above.

Pilot Surveys. The Department of Agriculture in Burma has taken a very real interest in the crop estimating work because accurate information is definitely helpful in carrying on its activities. Officials of that agency were in general agreement with Settlement and Land Records officials as to the relatively efficient system of estimating of acreage/agreed that the work on yields might be improved. and

The Department of Agriculture researchers, in carrying out certain fertilizer tests, used a random approach to selecting fields throughout one of the Districts of Burma. The project was carried on an extensive basis in the form of a pilot survey in which the Agricultural Field Assistants were made responsible for supervising the operation. The actual conduct of the survey was made by fieldmen drawn locally^{1/}. A manual of instructions for making and recording the data was provided as a guide; and the fieldmen were given intensive training on how to carry on the survey. Emphasis was placed upon the yield estimating feature of the survey in that three of the four fields selected from each kwin were used for crop cutting per se, the fourth for fertilizer treatment. The fertilizer

^{1/} From the staff of the Land Records Department.

test plot was divided into six subplots of 1/20 acre each, five of which were treated, the other a control or check plot. The Department of

Land Records cooperated in the survey and supplied the kwin maps for use in carrying through the project. These combination crop cutting and fertilizer experiments were carried on for rice in each crop year beginning in 1954-55. 1/ There was a reasonable agreement between the series of indicated yields of untreated plots (crop cuttings) and control subplots. In both cases yields per acre were higher than the yields derived from the subjective reports obtained in the traditional manner. 2/

Should a decision be reached to utilize the objective crop cutting method to determine yields per acre, this valuable experience will serve to good advantage.

The Agricultural Department was concerned with learning more of the processes of production and marketing of crops and before the war undertook to make market surveys. It sent the agents into several regions to gather information concerning all angles of production, local consumption, stocks, movement out, seeds used, etc. This activity was disrupted by the war but by that time they had completed the work for a number of crops. Not all of these were published but enough were published to indicate the usefulness of this type of an approach.

Since the war a Marketing Division has been set up with a somewhat expanded function. As stated above, crop cuttings have been made in connection with the extensive study of fertilizers. The Division has established also a reporting service on prices of agricultural commodities at various stages of marketing.

National Coordination. There is a Central Statistical and Economics Department in the Burmese Ministry of National Planning which carries on the coordinating function of working with the various departments engaged in statistical work. In addition it includes as operating units the Census Division and the Foreign Trade Statistical Division. Detail of imports and exports are published currently in a special publication. The Department is also responsible for putting out a review of statistical work of the Burmese government.

Census of Agriculture. In 1953 the government of Burma made a population and agricultural census of 252 towns with a population of three million people. At this time the country was very much unsettled and it was inadvisable to do more than take the census of farms which were close to the larger cities. In 1954 another census was taken covering population, housing, agriculture, industry and cottage industry. In this census 2,131 village tracts were enumerated. The District Supt. of Land Records acts as District Census Officer.

1/ The Manual contains instructions and illustrations concerning crop cuttings for peanuts, tobacco, and chickpeas as well as rice. The results of the pilot surveys for these crops were not made known to me, though I understood that in all about 1,400 sample areas were included in 1957-58, including surveys for rice, peanuts, tobacco, chickpeas, wheat and cotton.

2/ Experiments were also conducted on cotton, tobacco, peanuts, chick peas, and wheat; in 1957-58 were added sesame, sorghum, butter beans, sugar cane, corn, jute, and pebyugle (Phaseolus lunatus).

Burma has about 20,000 tracts in all; when the outlying states are included, a total of about 30,000 tracts. Security reasons still prevent getting too far away from the rivers. The preliminary "minimum" 1961 schedule for a census of agriculture has 38 questions; the "expanded" schedule to be taken on a part of the farms has 53 questions.

Land Records. In North Burma, the North Burma Settlement Officer in Mandalay arranged for visits with the District officers at Mandalay and Sagaing, and kwin fieldmen at Ngwe Daung and Kyaukme village tracts. Here we checked with them the method of carrying out the instructions in connection with the collection of statistics as a by-product of the assessment of the taxes against the land. Also several maps were checked against actual fields by walking the boundaries of the fields. We found that the District officers, inspectors and fieldmen were well informed as to the purpose of the work and their part in it. We also found that the maps were a good representation of the field both as to shape and as to size. In the District Office at Sagaing we found the records for the District housed in a reasonably fireproof brick and concrete structure which is set apart from any other houses in the town. It had in it a series of racks upon which the records for individual villages were kept in tin tubes which were quite dust proof and presumably also protected the records from possible damage because of water or damage by rodents or insects. The records examined ran back to the turn of the century showing the ownership and the operators of the land through the successive stages of review.

At Mandalay maps and statistical registers discussed and examined included the following:

- (1) Mandalay District Map.
 - (a) Shown by Tracts.
 - (b) Shown by Charges.
- (2) (a) Charge No. 38, Kwin No. 522, NGWE DAUNG Village.
 - (b) Charge No. 25, Kwin No. 523 B, KYAUKME Village.
- (3) Collection of Basic Data.
 - (a) Register 1 A:- Register of Holdings, History of Owners, Land Status and Tenures. Settlement Soil Class and Areas Theoretical Assessment Rates.
 - (b) Register VI. Area of Fields.
 - (c) Register 1 B. Register of Fields Land Uses.
 - (d) Register II. Crop Statistics and its area sown at different season. Assessment involved in it.
 - (e) Register III A, and III B. Register of Tenents and Land Alienation of Hldings.
 - (f) Collection of cattle census.

Mandalay maps and statistical registers (contd.)

- (4) Compilation of Statistics.
 - (a) Charge statistical note book.
 - (b) District Totals.
 - (c) Forecasts for 5 crops: -
Early Sessamum, and Late Sessamum,
Cotton, Paddy, and Groundnut.
- (5) Publishing of Statistics.
 - (a) Season and Crop Report.
 - (b) Weekly Crop Reports.
- (6) Burma Settlement Instructions.
- (7) Settlement Reports on Kyaukse, Mandalay and Maymyo.
- (8) Report Statement 10. Outturn for various crops.
- (9) Methodology of obtaining such statistics by crop cutting method.
 - Field Form 1. Compilation Form 4.
 - Field Form 6. Compilation Form 7
 - Report Statement 10.
- (10) Methodology of obtaining such statistics by enquiry and interview method.
 - Field Form 1. Field Form 6.
 - Compilation Forms 6 and 7, Report Statement 10.

The district supervisors that we met and the fieldmen who worked with them all seemed to be young men of promise. Among them were a number of university trained agricultural workers.

Comments. Prospects seem bright for the development of better agricultural statistics in Burma. The system of collecting information on acreage sown may have some bias because it is tied to the taxation system. It seems to be well administered and has the merit of being an objective count and not an enumerative survey subject to memory and personal-interest biases. At the present time the instruction calls for a complete count of fields growing specified crops and a summarization of the acreages sown to each crop. It is entirely possible that research might reveal that it would be advantageous to take samples of acreage and thus give the fieldmen time to devote to other work. The present system of estimating yields is quite inadequate in that the reports are purely subjective. They involve reports of total production by individual farmers which are then compiled by the fieldmen.

Here there might be material subjective bias which would justify the conclusion that the official estimate is low. Eventually production should be checked by a supply and distribution approach. Since much of the rice crop is exported a sample approach to ^{determine} use for seed and local consumption and season end surveys of stocks should provide a check of production against the other factors in supplying and distribution tabulation. Settlement and Land Records Department officials are in agreement with agricultural officials with respect to the need of an objective method of estimating yields. In view of the pilot crop cutting already done, it seems feasible to accomplish this technical improvement.

Once the final estimated yield per acre has been established on a reasonably precise basis it should be possible to make adequate forecasts of production by reporting condition of crops during the growing season and correlating condition series with the final yields series obtained from the crop cutting experiments.

For some of the minor crops in Burma not only the forecasts of production but also the final estimates of production are based upon condition figures applied to a predetermined normal. This makes it impossible to determine whether or not a real relationship exists between reported condition during the growing season and the final yield per acre. Undoubtedly the responsible officials will consider the merits of asking for final reports of yield expressed in units in which the commodity is customarily harvested, rather than in percentage of normal.

The use of predetermined normal in arriving at yield per acre from an application of condition figures is a questionable approach to the determination of yield. A somewhat similar system was used in the United States crop reporting service in the early part of the present century. It was discarded after research demonstrated that the relationship between the reported condition at any given date and the final yield per acre as determined independently was not a straight line as is implied when the predetermined yield is multiplied by the reported condition. The officials of the Departments are well aware that some improvement of methodology would be desirable at least on a research basis to test out different approaches to obtaining yield per acre.

Since instructions to fieldmen call upon them to visit every field in the country, it is strange that information is not collected on the minor crops which contribute to the food supply and income of agricultural producers. It is surprising also that some information at least on a sample basis is not collected concerning the production of milk, butter, poultry products, and livestock slaughter.

While communications are slow, it is anticipated that administrative procedures will be developed to provide more timely issuance of all reports. This would seem to be of paramount interest in a country in which agricultural exports are of such importance.

